



Attorney Docket No.: 42390.P10398

Patent**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:	Leeper, David G.)	
)	
Serial No.	09/964,820)	Group Art: 2634
)	
Filed:	09/26/2001)	Examiner: Vartanian, Harry
)	
Title:	Apparatus and Method for)	
	Handoff in a Wireless System)	

Assistant Commissioner of Patents
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. §1.131

I, David G. Leeper, declare that I am an inventor of the invention ("present invention") defined in all claims of the above-identified patent application ("present application"), and all of the events described or mentioned in this declaration occurred in the United States.

I further declare the following:

The present invention was conceived prior to February 28, 2001 (the "effective date"). This is evidenced by the written description of the present invention prepared and dated in an invention disclosure form (Exhibit) evidencing possession of the invention prior to the effective date. The dates on the Exhibit have been redacted.

Soon thereafter, the invention disclosure form was diligently submitted to an Intel (the Assignee) intellectual property committee for review. Soon

thereafter, the invention disclosure form was reviewed by the committee, and the committee decided to file a patent application covering the present invention.

Soon thereafter, a patent attorney was diligently contacted by the committee and was tasked with preparing the present application.

Soon thereafter, an initial draft of the present application was prepared by the patent attorney and forwarded to me for my review. After at least one iteration of diligent review by me and diligent revision by the patent attorney, incorporating my comments, a final draft of the present application was provided to me for my signature. Soon thereafter, the present application was diligently filed.

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

David G. Leeper

April 22, 2005

(Date)

David G. Leeper

(Signature)

INTEL INVENTION DISCLOSURE

ATTORNEY-CLIENT PRIVILEGED COMMUNICATION

DATE: 16179Wireless
Comm / NBG / NBI

It is important to provide accurate and detailed information on this form. The information will be used to evaluate your invention for possible filing as a patent application. When completed and signed, please return this form to the Legal Department at JF3-147. If you have any questions, please call 264-0444.

1. Inventor: Leaper David G
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 Supervisor* _____ WWID _____ Phone _____ M/S: _____

*If you are unsure of this information, please discuss with your manager.

(PROVIDE SAME INFORMATION AS ABOVE FOR EACH ADDITIONAL INVENTOR)

2. Title of Invention: Method and Apparatus for Handing Off a Frequency-Hopping Radio from One Master to Another
3. What technology/product/process (code name) does it relate to (be specific if you can):
Bluetooth Products Ambler, Yeldro, Fallbrook, Pescadero, Windances, Newbreak
4. Include several key words to describe the technology area of the invention in addition to #3 above: Invention allows for handoff in a way that is consistent with FCC Rules 15.247, including the proscription against hopping sequence coordination.
5. Stage of development (i.e. % complete, simulations done, test chips if any, etc.): Disclosure only.
6. (a) Has a description of your invention been, or will it shortly be, published outside Intel:
 NO: X YES: _____ If YES, was the manuscript submitted for pre-publication approval? _____
 IDENTIFY THE PUBLICATION AND THE DATE PUBLISHED: _____
- (b) Has your invention been used/sold or planned to be used/sold by Intel or others?
 NO: X YES: _____ DATE WAS OR WILL BE SOLD: _____

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(c) Does this invention relate to technology that is or will be covered by a SIG (special interest group)/standard/ or specification?

NO: _____ YES: X Name of SIG/Standard/Specification: Bluetooth Special Interest Group

(d) If the invention is embodied in a semiconductor device, actual or anticipated date of tapeout? No

(e) If the invention is software, actual or anticipated date of any beta tests outside Intel None as Yet

7. Was the invention conceived or constructed in collaboration with anyone other than an Intel blue badge employee or in performance of a project involving entities other than Intel, e.g. government, other companies, universities or consortia? NO: _____ YES: X Name of individual or entity: Stimulated by problem discussion with M-Diversity, Inc

8. Is this invention related to any other invention disclosure that you have recently submitted? If so, please give the title and inventors: No

**PLEASE READ AND FOLLOW THE DIRECTIONS ON
HOW TO WRITE A DESCRIPTION OF YOUR INVENTION**

Please attach a description of the invention to this form, DATED AND SIGNED BY AT LEAST ONE PERSON WHO IS NOT A NAMED INVENTOR, and include the following information:

1. Describe in detail what the components of the invention are and how the invention works.
2. Describe advantage(s) of your invention over what is done now.
3. **YOU MUST include at least one figure illustrating the invention.**
If the invention relates to software, include a flowchart or pseudo-code representation of the algorithm.
4. Value of your invention to Intel (how will it be used?).
5. Explain how your invention is novel. If the technology itself is not new, explain what makes it different.
6. Identify the closest or most pertinent prior art that you are aware of.
7. Who is likely to want to use this invention or infringe the patent
if one is obtained and how would infringement be detected?

***HAVE YOUR SUPERVISOR READ, DATE AND SIGN COMPLETED FORM**

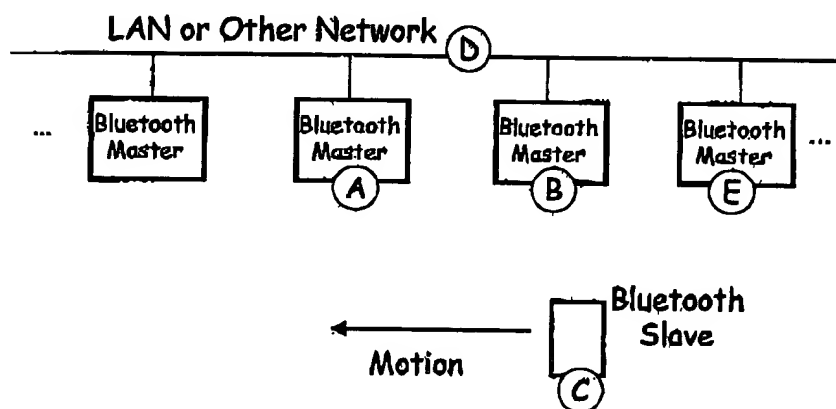
DATE: [REDACTED]

SUPERVISOR: [Signature]

BY THIS SIGNING, I (SUPERVISOR) ACKNOWLEDGE THAT I HAVE READ AND UNDERSTAND THIS DISCLOSURE, AND RECOMMEND THAT THE HONORARIUM BE PAID

Bluetooth* Handoff Method

Consistent with FCC Rules Part 15, Section 247



Introduction:

Bluetooth™ is a short-range, low-power, frequency-hopping wireless standard that makes possible data and voice communications over distances of approximately 10 to 100 meters. Details appear in the specification ("Spec") available at <http://www.bluetooth.com>. While this disclosure is described in Bluetooth terms, it applies to any radio that uses a frequency-hopping technique, coding technique or other method for segregating radio communications among differing networks.

Description of Components:

The components of this invention are two or more Bluetooth radios configured as Masters [A, B], and a mobile-in-motion Bluetooth radio configured as a Slave [C]. The Master and Slave both include a controller and software needed to manage communications and the handoff process described in this disclosure. Also present is a Local Area Network (LAN) or other network, wired, or wireless, that allows the Masters to communicate with one another [D].

Description of Problem:

In the usual mode, a Bluetooth Master, B, can communicate with a Bluetooth Slave, C, as long as said Master is within range of said Slave. If Slave C moves out of range of Master B communication will be lost. Master A can communicate with Slave C once it is in range, but the acquisition process takes time and is disruptive to communications, especially voice communications.

The acquisition process is made more difficult by FCC Rules Part 15, Section 247, which require that the hopping sequences used by Master A and Master B cannot be coordinated by any central controller – that is, they must be separately and independently selected by each of the Masters A and B. Therefore, Slave C must “discover” the presence of Master A, be told what is particular hopping sequence is, and then negotiate with Master A to join its network before communications can be resumed.

The Invention:

By adding the LAN and appropriate software to the Master and Slave, the handoff from Master B to Master A can be facilitated as follows:

As Slave C moves out of range of Master B, Master B indicates via the LAN to its nearest neighbors that it is losing communication with Slave C and needs assistance in maintaining a data connection.

Master B supplies the hopping sequence, time slot identification, timing, id codes, and other information needed by receivers in Masters A and E to look for Slave C. Masters A and E respond by informing Master B of the hopping sequence, time slot identification, timing, and id codes needed for Slave C to connect the Master A or E.

Using the Receive Strength Signal Indicator capability specified for Bluetooth-Spec-compliant radios, the Master (A or E) that first hears Slave C clearly, sends its hopping sequence, time slot identification, timing, and id codes to Master B for relay to Slave C.

With this information “in hand”, Slave C can connect to the new Master (Master A in the diagram) with no separate discovery process and minimal disruption to communications.

This approach is consistent with FCC rules since it still allows the Masters to choose their own hopping sequences separately and independently of one another.

In one commonly expected mode of operation, the network D will already be present as a means to providing an Internet connection to Slave C. In such cases, this invention simply uses that network for an additional purpose.

Value of Invention:

The short range and low power of Bluetooth-based communications offer many advantages, but the disadvantage of such short range is that mobile-in-motion devices can easily lose communications. This invention allows for continuous

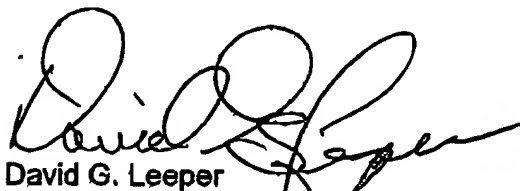
communications even for devices that are in motion, so long as the device remains within range of any Master that is connected the Network D.

Novelty:

The author of this disclosure is aware of no comparable methods for permitting handoffs for Bluetooth radios. The subject of handoffs in Bluetooth is new. Prior art must be examined to determine whether this approach is novel.

Application:

The many companies developing Bluetooth, IEEE 802.11, IEEE 802.15, HomeRF™, or short-range radio solutions must ultimately be concerned with handoff solutions. Any of these companies may have need of this invention.


David G. Leeper


Date



Witness


Date

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